

521 M7280 – SATELLITE GEODESY

SPRING SEMESTER 2017

Lab No. 9

handed out Wednesday, May 31, 2017
due Wednesday, June 07, 2017, 09:10 **Name:** _____

Solving Receiver Positions by Least-squares

1. Use the results from your previous lab (Lab No. 8):
 - a. Find all visible range observations from satellites to an assumed receiver.
 - b. Add 20-cm random errors to the above range observations.
 - c. Add 1-m random errors to the satellite positions.
 - d. Tabulate a, b, and c with 6 columns (Obs_ID, S, Sr, Xs, Ys, Zs).
2. Use 1b, 1c, and 1d to compute the receiver's positions. Report the estimated receiver coordinates, standard deviations, DOPs, and true errors for the obtained solution.
3. Repeat 1 and 2 but now for another receiver. Evaluate the estimated errors and true errors for the baseline vector between the two receivers.
4. Discuss your results.

Use for $GM = 398600.4418(\text{km}^3/\text{s}^2)$, $\omega_e^* = 7292115.8553 \times 10^{-11}(\text{rad/s})$,
 $\omega_e = 7292115 \times 10^{-11}(\text{rad/s})$, and $R = 6371.000000(\text{km})$.

Your (individual) final report should contain (use A4 papers):

- this page as the cover sheet
- source code(s) and outputs; do not forget to add your name and lots of comment cards to the source listing (%
- input and output files from program [input/output values used and calculated], if any
- plots, including captions on axes, title, your name, LB#/HM#, course title, date (if any)
- derivation and description of formulas used, accompanied by figures where applicable
- evidence of computational accuracy
- discussion of results